Types of Evidence in Causal Arguments

Everything's an Argument Ch.18 gives an overview of different types of evidence. In causal arguments, you can draw on at least three kinds of evidence that provide special insight.

That evidence is important because, used wisely, it helps you avoid the logical fallacy associated most strongly with causal arguments: faulty causation, also known as the post hoc fallacy. In this fallacy, someone identifies two phenomena and determine that they have a causal relationship because one happened before the other. Examples:

"My child received his vaccination (cause), and a couple of weeks later he started showing signs of autism (effect)."

"My team keeps on winning (effect) as long as I wear my lucky socks (cause)."

How do you know if two phenomena actually have a causal relationship? Look for the following types of evidence:

Experimental evidence

Experiments are designed to isolate factors and determine if one really does cause the other. Formal experiments are deductive: they start with a hypothesis (ex: thimerosal causes autism) and systematically test that hypothesis to prove or disprove it. Experimental evidence yields a high degree of certainty.

Comparative evidence

Comparisons can be highly effective when experiments cannot be conducted. For instance, Glassner describes comparative studies in which the rate of birth defects is examined in the children of military personnel deployed to the Persian Gulf vs. deployed elsewhere. The studies show no difference -- and therefore no effect to investigate. Comparative studies can yield a high degree of certainty as well, though not as high as well designed experiments. Comparative studies can be either deductive or inductive.

Anecdotal evidence

Unlike the other two, anecdotal evidence is not systematically collected or analyzed. It tends to come from sets of testimonies in which people note similar patterns. For instance, if many parents notice that their children developed autism shortly after taking vaccines, they might form a hypothesis about a causal link. Anecdotal evidence tends to be inductive: it starts with general observations and develops a hypothesis that explains them. Anecdotal evidence does not yield a high level of probability, but it does generate hypotheses that can then be tested out with other methods.